GARY WORKS FACILITY-WIDE RCRA CORRECTIVE ACTION PROGRAM

Interim Stabilization Measure Workplan
East Lake SWMA
ELA-3 Addendum

Prepared for:

Gary Works

June 2011

LIST OF FIGURES

LIST OF TABLES

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Definition
µmhos/cm	micromhos per centimeter
AOC	Area of Concern
AOI	Area of Interest
CAMU	Corrective Action Management Unit
CASP	Carbon Alloy Synthesis Process
CAS-RN	Chemical Abstract Service – Registry Number
CITE	Community Involvement Team Effort
COC	Chain of Custody
CQAP	Construction Quality Assurance Plan
DMP	Data Management Plan
DQO	Data Quality Objective
Eh	Oxidation Reduction Potential
EL	East Lake
FID	Flame Ionization Detector
FW	Facility-Wide
ID	Identification
IDW	Investigation Derived Waste
ISM	Interim Stabilization Measure
J	Estimated
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spike / Matrix Spike Duplicate
msl	mean sea level
mV	millivolt
ºC	Degrees Celsius
ºF	Degrees Fahrenheit
OMP	Operation and Management Plant
PID	Photo-ionization Detector
QA/QC	Quality Assurance / Quality Control
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

SWMA	Solid Waste Management Area
USEPA	United States Environmental Protection Agency
USS	United States Steel Corporation
VOC	Volatile Organic Compound

1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) issued an Administrative Order of Consent (Order) (USEPA Docket Number 88H-5-00-001) to United States Steel Corporation (USS) on October 23, 1998 (USEPA, 1998). The Order contains requirements to conduct a Facility-Wide Resource Conservation and Recovery Act (RCRA) Corrective Action Program at USS' Gary Works facility in Gary, Indiana (Facility) to investigate and remediate, where necessary, Solid Waste Management Areas (SWMAs).

One of the nine SWMAs at the Facility is the East Lake (EL) SWMA. The EL SWMA, which encompasses approximately 524 acres (**Figure 1**), incorporates the portion of the Facility north of the Coke Plant SWMA, east of the Vessel Slip and Turning Basin, and west of the Facility's eastern property boundary.

A document entitled *Addendum to the East Side RCRA Facility Investigation Report* (East Side RFI Report Addendum) (USS, 2010a) was submitted for USEPA's review on March 8, 2010 and revised and resubmitted on June 4, 2010 (USS, 2010b) to document the laboratory analytical results collected at the Area of Interest (AOI), a parcel that is approximately 23 acres in size and located near the northwest portion of the EL SWMA within the footprint of Area of Concern (AOC) ELA1 (**Figure 2**). The objectives of the AOI investigation were to characterize the environmental conditions within the AOI and collect information necessary for future decision-making as related to the planned construction activities at the AOI.

Following the conditional approval of the East Side RFI Report Addendum by the USEPA on July 20, 2010, the *Interim Stabilization Measure Workplan. East Lake SWMA. Area of Interest at ELA-1 and ELA-3* (ISM Workplan) (USS, 2010c), prepared to meet the requirements specified in Attachment III of the Order, was submitted on June 4, 2010 to present proposed approach to implement stabilization measures for the AOI and portions of the AOC ELA3. This document provides information regarding the final design for the storm water retention basin to be constructed at AOC ELA3.

1.1 Background

Two new Carbon Alloy Synthesis Process (CASP) modules are being constructed at ELA1. Detailed information regarding site-preparation activities related to the construction of the CASP modules is provided in monthly progress report to USEPA beginning on September 15, 2010.

The ISM Workplan Addendum covers planned actions for portions of the AOC ELA3 (Blowdown Sludge Dewatering Area), located north of SWD-1 and south of ELA1. ELA3 is comprised of two dewatering areas – the eastern dewatering area is approximately 179 feet

long by 60 feet wide by 20 feet deep and the western dewatering area is approximately 163 feet long by 52 feet wide by 20 feet deep. The blowdown sludge has been removed from ELA3. The plan is to develop the western dewatering area at ELA3 as a storm water retention pond for the proposed CASP modules at ELA1.

Presented below is the status of estimated percentage of ISM work completion based on the latest monthly progress report, submitted to USEPA on March 15, 2011.

ELA1

- Level C-Module site grade 100%
- Level D-Module site grade 95%
- Installation of C-Module foundations 75%
- Installation of D-Module foundations 30%
- Installation of 18" of Slag Backfill Material 50%

ELA3

- Excavation of storm water basin 0%
- Installation of storm water Retention Basin 0%

1.2 Organization of the ISM Workplan

The remainder of this Workplan is organized based on the requirements provided in Attachment III Sections A through C of the Order.

- **Section 2** provides the objectives of the ISM.
- **Section 3** presents the design plans and specifications.
- **Section 4** references the health and safety plan for the site.
- **Section 5** presents the data collection quality assurance plan.
- **Section 6** references the Facility's data management plan.
- **Section 7** references the Facility's public involvement plan.
- **Section 8** provides the ISM implementation program.
- **Section 9** presents the schedule for implementation of the ISM.
- **Section 10** presents the references used in the preparation of this workplan.

2.0 ISM OBJECTIVE

The objective of the ISM Workplan Addendum is to remove a majority of any potential impacted material (down to groundwater) at ELA3 prior to construction to ensure that pathways to residual chemicals have been addressed to protect human health and the environment.

3.0 DESIGN PLANS AND SPECIFICATIONS

The following sections discuss how the objectives of the ISM for ELA3 will be met.

3.1 Design Strategy and Design Basis

Presented below are the proposed stabilization measures:

- Western Dewatering Area at ELA3
    1. Excavate and remove soil to the top of the hard pan layer or to the top of the water table (whichever is encountered first) as indicated in **Figure 3.**
    2. Cover with slag/fill to bring the elevation of the bottom of the area to 590 feet mean sea level (msl). This is 5 feet above the highest groundwater level, estimated to be at 585 feet msl, based on the current groundwater level of 583 feet msl in the ELA3 area and an observed fluctuation of 2 feet.
    3. Remove excavated material to the Corrective Action Management Unit (CAMU) at the Facility. A *Request to Dispose of RCRA AOC ELA-3 Wastes in the CAMU* will be submitted after completion of the proposed confirmation sampling activities as described in **Section 5.3.2**.
    4. Install water tight liner and associated piping infrastructure to construct a facility storm water retention area.

3.2 Technical Factors of Importance

Not applicable.

3.3 Assumptions Used in Developing the Design Plans for ELA3

Described below are assumptions used in the design of the ISM at the storm water retention pond.

- Current groundwater level near ELA3 at 583 feet msl.
    - Maximum groundwater level is estimated to be at 585 feet msl, based on a 2-foot fluctuation above the current groundwater level.
    - Maximum groundwater level plus 5 feet = 590 feet msl.
- Assumption that the material needs to be removed based on Phase I RFI data and April 2011 ELA-3 supplemental sampling data.

- Volume estimate for material to be removed (based on contours/survey/basin design slope and past boring information). The final volume of material removed will be dependent upon the lateral extent of the hard pan layer.

With the exception to the potential for a change in the volume of material to be removed, the presence of the hard pan layer will not affect the design, operation, or verification sampling for the ISM.

Sources of errors are limited to the items discussed in the risk evaluation presented in the Revised East Side RFI Report Addendum (USS, 2010b) and the conservative assumption that the Phase I data and April 2011 supplemental data for ELA-3 indicates that the material needs to be removed.

Figure 3 presents the proposed storm water retention pond design for the 25-year return period. Detailed technical information concerning the design can be provided post action, if necessary.

4.0 HEALTH AND SAFETY PLAN

Manganese is the only chemical detected in one soil sample collected within the footprint of the western dewatering area at ELA3 at a level above the construction worker screening value. Risks to construction workers potentially posed by manganese in soil will be effectively mitigated by the use of typical construction procedures such as dust suppression.

Air monitoring was conducted in August and September 2010 during excavation activities at the CASP area to evaluate concentrations of iron and manganese (in personal exposure air samples) and total particulates (in ambient air samples). As presented in the Monthly Progress Report No. 1 and No. 2 (submitted by USS on September 15, 2010 and October 15, 2010, respectively), the results of the monitoring indicate that additional air monitoring is not warranted because there is no airborne exposure when following the procedures set forth for excavation activities on this project. Detailed information regarding the air sampling procedures used and results obtained is presented in a report entitled "*Initial Exposure Air Monitoring Assessment Report*", prepared by TTL Associates, Inc. (dated September 24, 2010). A copy of this report was provided to USEPA in the CASP Area Monthly Progress Report No. 2. In addition, the previously submitted air monitoring report "*Initial Exposure Air Monitoring Assessment Report*" is presented in **Appendix A-1** for ease of review.

Appendix A-2 presents the previously submitted Health and Safety Plan prepared in accordance with relevant Occupational Safety and Health Administration) requirements with respect to procedures to be implemented to protect workers from exposure to particulates and dusts during construction activities for the CASP project. As previously discussed, while continued personal monitoring is no longer required, the Training, Engineering and Administrative Controls and Personal Protective Equipment sections of this document are still relevant to the planned excavation activities for this ELA3 Addendum.

5.0 DATA COLLECTION QUALITY ASSURANCE PLAN

5.1 Data Collection Strategy

All data will be collected in accordance with the *Gary Works Facility-Wide RCRA Facility Investigation Work Plan. Volume 2: Quality Assurance Project Plan* (QAPP) (USS, 2009a).

5.2 Data Quality Objectives for ELA3

The data quality objectives (DQOs) were established to ensure that the field and laboratory analytical results were of sufficient quality and quantity to support the decisions to be made during the sampling event. The DQOs for the ISM will be consistent with the DQOs described in Section 1.4 of the Program QAPP (USS, 2009a) and the planned future use of the western dewatering area at ELA3.

There are no complete direct exposure pathways to chemicals in soil at the western dewatering area within ELA3 following the proposed excavation and construction of a storm water retention pond for the CASP Area.

The potential for chemicals in storm water to migrate to soil or groundwater at the western dewatering area or for chemicals in groundwater to migrate to storm water is deemed low due to the proposed filling of the excavated area with a 5-foot layer of slag and the installation of a water-tight liner.

Based on the current construction plan for the storm water retention pond, the only samples to be collected at ELA3 as part of the ISM will be 10 soil samples from the bottom and sidewalls of the excavation to provide information concerning residual chemicals that remain in place prior to backfilling and liner installation.

5.3 Sampling Plan

This section presents information regarding the media of interest (**Section 5.3.1**), sampling that will be conducted prior to excavation to characterize the nature and extent of impacts at the western dewatering area (**Section 5.3.2**), and sampling that will be conducted post-excavation to quantify residual concentrations that may remain (**Section 5.3.3**).

5.3.1 Media of Interest

The environmental media of interest for the ISM are slag/urban fill and soil at ELA3.

5.3.2 Characterization Sampling

Presented below is a brief description of the scope of work for the characterization sampling:

- Four additional soil samples will be collected from the bottom of the western dewatering area, away from the boring location EL-SB057 near the center of the dewatering area that was sampled as part of the EL SWMA Phase I RRFI efforts.
- Samples will be collected from 1 to 3 feet below surface because groundwater was encountered at 4 feet below surface when drilling at EL-SB057.
- Soil samples will be analyzed for Facility-specific Appendix IX parameter groups and Floyd Brown analytes.
- One sample will also be analyzed using the Synthetic Precipitation Leaching Procedure (USEPA Method 1312).

5.3.3 Confirmation Sampling

At ELA3, post-excavation samples will be collected from nine locations to document residual chemicals (if any) that remain in place prior to backfilling and installation of the storm water retention area.

- Three locations at the sidewalls (one on the north sidewall and two on the south sidewall), 1-3 feet above the bottom of the excavation;
- Two locations at the end walls of the excavation (one from the north end and one from the south end) 1-3 feet above the bottom of the excavation.
- Four locations along the base in the interval just above the groundwater.

One sample will be collected from each of the nine locations. In addition, one field duplicate sample will be collected from one of the locations for quality assurance/quality control purposes. Sample locations will be selected in the field based on field indicators (e.g., staining, odor, and elevated photo-ionization detector [PID] values). The use of this conservative approach ensures that samples will be collected from mostly likely impacted locations.

Confirmation samples will be analyzed for constituents on Table 3-1 of the East Side RFI Report Addendum (USS, 2010b). The sample results will be compared to applicable screening levels to evaluate any potential risks from residual chemicals (if any) that remain.

5.3.4 Field Sampling Designation System

A unique sample identification (ID) code will be generated for each sample collected. This includes, but is not limited to, laboratory samples and field measurement samples. The sample ID code will be used on sample labels, Chain-of-Custody (COC) forms, tables summarizing sampling locations or analytical results, and drawings illustrating sampling locations or analytical results.

The field sample identification system described below follows the procedures outlined in Section 4.6 of the Program QAPP (USS, 2009a).

5.4 Sample Analysis

5.4.1 Analytical Laboratory

Samples collected for the laboratory analysis will be analyzed by:

TestAmerica Laboratories, Inc.
4101 Shuffel Drive NW
North Canton, Ohio 44720
(330) 497-9396

The analytical procedures for this laboratory are provided in East Side SAP Addendum (USS, 2009). The laboratory will perform all analyses in accordance with these methods.

5.4.2 Quality Control/Quality Assurance Sample Collection

Quality assurance/quality control (QA/QC) samples will include equipment blanks, field duplicates (FD), matrix spike/matrix spike duplicates (MS/MSDs), and trip blanks, as described in Section 4.15 of the program QAPP (USS, 2009a).

QA/QC samples will be collected as described below:

- Equipment blanks – Equipment blanks will be collected at a frequency of one field blank for every 10 or less aqueous samples of each matrix. Distilled/de-ionized water will be poured over the decontaminated sampling equipment, captured in clean laboratory-supplied containers, and analyzed for the same parameters as the associated groundwater samples.
- Field duplicates – Field duplicates will be collected at a frequency of one field duplicate for every 10 or less investigative samples of each matrix. Groundwater field duplicates will be collected by alternately filling two sets of identical sample containers from the interim container used to collect the sample. Surface water field duplicates will be collected by alternately filling two sets of identical sample

containers. All field duplicates will be analyzed for the same parameters as their associated samples.

- MS/MSDs – MS/MSD samples will be analyzed at a frequency of one for every 20 or less investigative samples of each matrix. For those samples designated as MS/MSDs.
- Trip Blanks - Trip blanks will be collected at a frequency of one trip blank for every shipment of aqueous volatile organic compound (VOC) samples.
- Field Blanks - One field blank will be collected from each source of decontamination water that is used.

5.5 Investigation Derived Waste

Wastes generated during sampling, including soil cuttings, purge water, decontamination liquids and other debris will be handled in accordance with the procedures outlined in Standard Operating Procedure F504 in Appendix F of the program QAPP (USS, 2009a).

USS proposes to place investigation derived waste (IDW), including any remediation waste, generated during the ISM activities within the appropriate cell of the CAMU. This will be detailed in the *Request to Dispose of RCRA AOC ELA-3 Wastes in the CAMU* that will be submitted after completion of sampling activities as described in **Section 5.3.2**.

6.0 DATA MANAGEMENT PLAN

All data will be managed in accordance with the *Gary Works Facility-Wide RCRA Facility Investigation Work Plan Volume 3: Data Management Plan* (DMP) (USS, 2004).

6.1 Data Record

Section 3 of the DMP (USS, 2004) details how data obtained will be recorded. This includes field measurements as well as laboratory analytical results. It is essential that samples or measurements be uniquely identified in time and space. This identification is essential when multiple samples in multiple investigations are being collected. By having the format for sample identification and sample identification procedures clearly defined, the results obtained from these samples can be used with confidence to make sound and rational technical decisions. Section 3 of the DMP (USS, 2004) provides the procedures and format for the data record.

6.2 Tabular Displays

Both the working data record, as well as the permanent data record, will be managed and presented in a tabular format. The raw data obtained from the field, which will be entered and stored within the electronic database, can be presented in a tabular format. Information such as PID and/or flame ionization detector (FID) readings, depth to groundwater, or pH, will be sorted and have the ability to be displayed as a table. In addition, the analytical results obtained directly from the laboratory will be presented in tabular format. Upon completion of the validation process, the information in the permanent data record will be displayed in a tabular format. By presenting information in a table, it is much simpler to review and analyze. The information will be exported from the electronic database system and a spreadsheet software program (e.g., Microsoft Excel) will be used to display the information in a tabular format. The program DMP (USS, 2004) provides the procedures and format for the tabular displays.

Tabular Data Submittals

Analytical data will be reported digitally in a tabular format with the following fields for each record:

a. Sampling Date: Month, day, and year;

b. Sample Location: To be consistent throughout the project;

c. Sample Type: Regular, duplicate(s), trip blank(s), equipment blank(s), field blank(s), verification resample(s) and replicate(s);

d. Species Name: chloride, sodium, ammonia, etc.;

e. Concentration (results);

f. Concentration Units: milligram chemical per kilogram soil (mg/kg), standard units for pH, degrees Celsius (^{o}C), or degrees Fahrenheit (^{o}F) for temperature, millivolts (mV) for oxidation-reduction potential (Eh), and micromhos per centimeter (μmhos/cm) for specific conductance;

g. Detected: Yes or No; (a "U" qualifier means No, absence means Yes);

h. Reporting Limit;

i. Method Detection Limit;

j. Analytical methods;

k. Chemical Abstract Society Registration Number (CAS-RN); CAS-Equivalent numbers (defined in Terrabase) will be used when no CAS number is defined;

l. Estimated Value: (a "J" qualifier means Yes, absence means No): Indicate Yes if the reported value is an estimated value. If a value is estimated, use the comment field to explain why the value was estimated.

6.3 Graphical Displays

Graphical formats can include bar graphs, line graphs, area or plan view drawings, isopleth plots, cross-sectional plots or transects, spider diagram, and three dimensional graphs. Graphical formats that may be used to properly present data include:

- **Bar graphs** to present data for relative comparisons (i.e., frequency of occurrence, historical data by time period, etc.);
- **Line graphs** to display time trends in data or other correlations of associated parameters;
- **Area or plan view drawings** to document sampling or measurement locations and specify potential receptor locations. The base topographic mapping and other appropriate map formats will be used to prepare graphical mapping displays;
- **Isopleth plots** to display measure or calculated gradients in properties or components measured; and
- **Cross-sectional plots or transects** to display data and information in vertical profile. All cross-sectional plots or transects will be accompanied by a plan view map or sketch that depicts the origin and terminus of the cross section and the orientation of the section relative to compass direction.

7.0 ISM IMPLEMENTATION PROGRAM

Attachment III Section B of the Order (USEPA, 1998) indicates that the following documents be prepared for the implementation of ISM.

- Final Design Documents
- Operation and Maintenance Plan (OMP)
- ISM Construction Quality Assurance Plan (CQAP)

Described below is the ISM implementation program at ELA3:

- Final Design Document.

  Information regarding the design and specifications of the storm water retention pond (i.e., excavation, backfilling with slag and installing a water tight liner) is provided in **Appendix B.**

- OMP

  Based on the proposed design, there are no operational or maintenance tasks required with the removal of impacted material and backfilling actions.

- CQAP

  During and upon completion of the excavation and backfilling operations, surveying will be conducted to ensure the elevations meet the design specifications (i.e., removal to 583 feet msl and backfill to 590 feet msl to ensure that the new storm water basin lining is not in contact with groundwater).

  Quality Control for the disposal of impacted material from the excavation will be addressed in the *Request to Dispose of RCRA AOC ELA-3 Wastes in the CAMU* which will be submitted after the sampling activities described in **Section 5.3.2**.

8.0 PUBLIC INVOLVEMENT PLAN

As a means for the USS Gary Works to maintain communication with the community regarding activities that are being conducted at the Facility, the following objectives have been developed:

- Identify potential stakeholders whose interests are directly related to activities conducted at the facility.
- Provide information to the public regarding facility-wide RFI activities at USS Gary Works.
- Encourage public involvement and participation.
- Provide a contact person for the public at USS and USEPA.

The public involvement activities are intended to address the objectives of the USS Gary Works public involvement program. Activities include those required under the USEPA guidance for public involvement plans and additional activities intended to address community concerns and to carry out the objectives established for the public involvement program. Public involvement activities include the following:

- Mailing list (stakeholders)
- Newsletters
- Community Involvement Team Effort (CITE) public meetings (*http://www.ussteel.com/corp/rcra/cite.asp*)

These activities are discussed in further detail in Section 3.0 of the *Gary Works Facility-Wide RCRA Facility Investigation Work Plan. Volume 5: Public Involvement Plan* (USS, 2004).

A presentation has been given at past CITE meetings that discussed this proposed ISM workplan and the request for placement of ELA-3 materials in the CAMU.

9.0 SCHEDULE

Table 1 presents an estimated implementation schedule for ELA3.

10.0 REFERENCES

United States Environmental Protection Agency (USEPA). 1998. Corrective Action Order Pursuant to Section 3008 (h) of RCRA. U. S. Steel – Gary Works, IND 005 444 062. October 1998.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels. Office of Solid Waste and Emergency Response, OSWER 9355.4-24. December 2002.

USEPA, 2009a. National Primary Drinking Water Regulations. EPA 816-F-09-0004. May 2009.

USEPA, 2009b. Regional Screening Levels. December 2009.

USEPA, 2010. East Side Conditional Approval Letter. U. S. Steel – Gary Works. January 26, 2010.

USS. 2004. Facility-wide RFI Work Plan, U.S. Steel Gary Works. July 1999, revised May 2000, December 2000, February 2001, May 2001, draft December 2002; and September 2004

USS, 2009a. Gary Works Facility-Wide RCRA Facility Investigation Work Plan Volume 2: Quality Assurance Project Plan. U. S. Steel – Gary Works. October 2009.

USS, 2009b. East Side Sampling and Analysis Plan Addendum. U. S. Steel – Gary Works. December 23, 2009.

USS, 2010a. Addendum to the East Side RCRA Facility Investigation Report. U. S. Steel – Gary Works. March 8, 2010.

USS, 2010b. Addendum to the East Side RCRA Facility Investigation Report. Revision 1. U. S. Steel – Gary Works. June 4, 2010.

USS, 2010c. Interim Stabilization Measure Workplan. East Lake SWMA. Area of Interest at ELA-1 and ELA-3. June 2010.